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THESIS

**AN EVALUATION OF THE IMPACT OF THE
TARGET FORCE PLANNING MODEL (TFPM) ON
THE MANPOWER PROCESS AT HEADQUARTERS,
U.S. MARINE CORPS**

by

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March 1999

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PLANNING MODEL (TFPM) ON THE MANPOWER PROCESS AT
HEADQUARTERS, U.S. MARINE CORPS**

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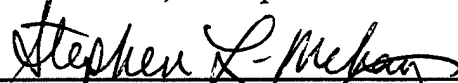


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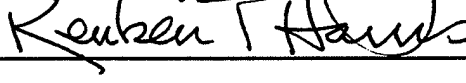
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This thesis examines the Target Force Planning Model (TFPM). The Marine Corps has been using different generations of this model since 1971 to determine the target force by grade and primary military occupational specialty (MOS) while taking personnel overhead and billets not requiring a primary skill into consideration. Interviews were conducted with the contractor, model manager, and primary users. This thesis identifies and makes recommendations for improvements centered around four key themes that emerged from the analysis. They are the need for better integration of the model and processes within the manpower system, development of concrete measures of effectiveness, improved documentation, and an effective education program. The study suggests that while the results of the TFPM are satisfactory for the users, organizational refinements could possibly increase its effectiveness.

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I. BACKGROUND

Since the late 1980s, the Armed Forces have been downsizing in response to the demise of the Soviet Union. This has created turbulence in the manpower departments of the military, as managers attempt to manage the force and also react to the myriad of questions asked by the policy makers.

The Marine Corps is a unique organization, particularly in its approach to staffing its headquarters. While some military branches have professional staff officers, any Marine Corps officer can be assigned to the staff of its headquarters. Along with civilians who provide continuity, these officers provide fresh input into the decision-making processes from the Fleet Marine Force. While this may not be the most efficient way to run a staff organization, it has proven to be an effective one, as the Marines themselves become part of the process and provide that vital link with reality in decision-making.

However, a big disadvantage to this system is the lack of continuity and effectiveness within these billets and consequently in the decision-making processes. Since the officers are assigned to the billet for only three years, there is a 33 percent turnover every year. There is also no formal training of officers assigned to manpower positions. Some receive a graduate degree from the Naval Postgraduate School (NPS). However, while this provides some background and tools for manpower planning for those officers, it does not completely train them for the new positions. This means that all Marines who report for their first tour at

HQMC are immediately on a very steep learning curve. Considering this process, it is imperative that the staff officers understand the models and processes that affect their sections. This knowledge will assist them in answering those difficult questions posed by policy makers and allow them to gain a better understanding of their role in the manpower process.

The Marine Corps has been using computer models for its manpower planning since 1963. One of the initial models was the Simulator for Total Requirements Authorization Forecast and Evaluation (STRAFE) model, developed by Decision System Associates, Incorporated (DSAI) in 1971 to assist manpower planners in determining manpower requirements. The Grade Adjusted Recapitulation (GAR) was an output of the STRAFE model.

Marines are identified by primary MOS and grade. The input to the STRAFE model included the number of marines categorized by AMOS or PMOS both primary MOSs and secondary MOSs but did not account for "Individuals." The individual's line is personnel overhead (T2P2), represents trainees, transients, patients, and prisoners. The GAR provided a repeatable process of determining the required grade and AMOS array of the force necessary to fill the manned billets given a plan for the individual's line. With the advent of computers, it could be developed in a matter of minutes instead of the four to six months required to generate a GAR by hand. (GAR Impact Study, 1972)

In July 1972, a year after the model was introduced, the GAR Impact Study was conducted. It included interviews with 13 sections at HQMC, some of which overlapped. The GAR Impact Study noted specific shortfalls of the GAR process and its relationship with these sections at HQMC. In the mid-1980s, the name of the model changed to the Target Force Planning Model (TFPM) and the name of the output changed to the Target Force. The output of the TFPM strongly influences accessions requirement planning, entry-level training requirements, promotion planning, and reenlistments. These items cover almost the entire manpower process. (TFPM User's Manual)

This thesis analyzes the results of the study as they pertain today. An interviewing tool similar to that used in the GAR Impact Study was used to determine if the Marine Corps has made the changes that were recommended in 1972, and to evaluate the current process. This thesis also provides documentation of one part of the process. This documentation can be used to assist new staff officers in understanding the manpower process. The thesis includes: (1) a review of manpower planning process and associated modeling systems; (2) an in-depth review of the current TFPM; and (3) interviews with the users of the output of the TFPM. The thesis also provides an evaluation of the current process and recommendations for improvements.

A. ORGANIZATION OF STUDY

The study is organized into three subsequent chapters. Chapter II outlines the process of deriving a target force, provides a history of the development of TFPM, discusses the GAR Impact Study of 1972, and explains the current modeling process for the TFPM. Chapter III discusses the interview structure and identifies the major themes concerning the manpower system and processes that emerged from the interviews. Chapter IV presents conclusions and recommendations based on the major themes. Summaries of the interviews are attached as appendices.

II. TARGET FORCE DERIVATION PROCESS

A. HISTORY

The use of models in manpower planning dates back as early as the late 17th century in the British Navy. By 1779, the Royal Marines were regularly analyzing career structures, retention rates, and promotion probabilities. (Rostker, 1982, p. 3) However, the full potential of modeling could not be realized until the 1960s with the availability of relatively cheap, powerful computers. The Marine Corps can trace its use of computer models for manpower planning back to 1963.

The computer was able to perform mathematical calculations in a fraction of the time that it took to perform the calculations by hand. This increase in speed allowed the planners to more realistically model real-world situations, evaluate several alternative plans and thereby arrive at a better solution in less time. Bartholomew perhaps best summarized the impact of computers on manpower planning,

It is the speed with which a large number of policy options can be explored on a computer that has revolutionized the way things have developed. (Bartholomew, 1991, p. 9)

There were several significant manpower issues that surfaced during the 1960s and 1970s for the United States military. Not surprisingly, probably the most significant were those predicated by the Vietnam War. The Vietnam War with its incredible demand for Marines put a real strain on the force and on military planners. Not only was there a large requirement within Vietnam, the

Fleet Marine Force (FMF) units that were not in Vietnam were also overcommitted. Rotating out of Vietnam into another FMF unit was hardly a chance for recovery and rejuvenation of an individual, and the effectiveness of Marines was a concern. Additionally, to meet the Vietnam Wartime requirements, the Marine Corps had to grow by 50 percent from 190,000 to 285,000 by 1968. (Millett, 1980, p. 577)

During the Vietnam War period, Marines were required to complete a 13-month tour in country before they rotated to another assignment. To support that notional 13-month tour policy, billets had to be available for those Marines not serving in Vietnam. "B-billets" became the counterbalance to billets in Vietnam and the FMF.

An "A-billet" is a billet that can be directly related to a primary military occupational specialty (AMOS or PMOS). A B-billet, on the other hand, is an organizational billet requiring a skill that is not necessarily unique to any AMOS, such as drill instructors, recruiters, security force guards, and rifle range instructors. It may also be known as a universal billet, especially for officers as any Marine, regardless of AMOS, can fill a B-billet. Thus, the staffing of B-billets is allocated to the population of AMOS Marines.

During Vietnam, the requirement to satisfy that 13-month tour would begin by determining the number of billets required outside of Vietnam. The total manpower "requirement," that is the total number of Marines needed in the force,

was considered to be the sum of the billets in Vietnam and the billets not in Vietnam. In simple terms, if those two numbers were the same, then a Marine could expect to spend roughly one-half of his time in Vietnam. If there were twice as many billets in the continental U. S. (CONUS) as there were in Vietnam, then the Marine could expect to spend about one-third of his time in Vietnam. (See Appendix G)

After Vietnam and the end of the draft, the overseas manpower requirement was comparatively much smaller, but still significant. It continued to drive the overall manpower requirement into the mid-1970s, when unit rotation dramatically decreased the requirement for overseas tours. While the overall size of the Marine Corps has dropped over 100,000 since Vietnam, the billet structure and many of the associated processes developed during that era are still used today.

Marine Corps manpower planning requires a description of the desired total force by grade and primary military occupational specialty (PMOS or AMOS). In 1971, the Simulator for Total Requirements Authorization Forecast and Evaluation (STRAFE) model was developed by Decision Systems Associates, Incorporated (DSAI) to meet this requirement. The output of the STRAFE model was the Grade Adjusted Recapitulation (GAR), a description of the desired total force by grade and AMOS. (GAR Study, 1972)

In theory, the process for development of the GAR has not changed over time. The STRAFE model used the Authorized Strength Report (ASR) and the

model dictionary as input. The ASR is a description of the Marine Corps by grade and MOS at a point in time, but it is listed by Monitored Command Code (MCC) and contains both A billets, that is those associated with primary skills, and B billets. It does not account for the trainees, transients, patients, or prisoners (T2P2) which are entered separately through dictionary input. The STRAFE model would attribute both the B-billets and T2P2 to AMOSs for an aggregate description of the total force by grade and AMOS.

Prior to the development of STRAFE, it required four to six months of calculations to develop the GAR. The STRAFE model enabled the model manager to perform these calculations in minutes. This dramatic reduction in time to calculate the GAR enabled the model manager to game different policy configurations. This is a particularly valuable asset during turbulent times when manpower policies are the subject of close scrutiny by policymakers and variation in the manpower structure have significant ramifications for the present and future force. (GAR Study, 1972)

B. GAR IMPACT STUDY

In 1972, in order to determine the effectiveness of the STRAFE model one-year after its implementation, Headquarters, U. S. Marine Corps (HQMC) commissioned DSAI to conduct the GAR Impact Study. The study was concerned with:

1. The identification of current users of the GAR;
2. The identification of valid requirements for the GAR;
3. A comparison of the STRAFE approach with that of the manual process;
4. The investigation and desirability of modifying certain STRAFE methodology; and,
5. The sensitivity of the STRAFE solution to alternative manpower policies.

The study was broken down into three phases. Phase I included interviewing HQMC manpower planners and identifying primary and secondary users of the GAR. The focus of this phase was to establish an audit trail that contained the names and the sections of the different users within HQMC. This was important because of the nature of the GAR and the implications it had for the plans, policies, and decision processes of the various sections. The appropriateness of the uses of the GAR by these users and sections was also to be examined; that is, whether or not the sections were using the output of the model correctly and whether or not their assumptions were correct concerning the model output. The final portion of this phase was to identify opportunities for development of special purpose GARs to support manpower planners at HQMC.

The second phase of the GAR study was based on a variety of issues that were identified through findings from the first phase. Specifically, the interviews identified the potential value of pursuing the following changes:

1. Modification of STRAFE solution methodology to include incorporating Table of Manpower Requirements (T/MR) manning factors to directly influence the Future Years Defense Plan (FYDP) reduction;
2. Investigation in detail of the problems associated with a spread of officer B-billets to AMOSs;
3. Modification of STRAFE entry level training line calculations to provide parallel distributions in the override and computational modes of operation;
4. Investigation of the problems associated with the spread of enlisted career training; and
5. Improvement of interface within T/MR process outputs.

Phase III of the GAR study was to investigate the sensitivity of the STRAFE solution to alternative manpower policies. This included the development of software that would display the building blocks used in the construction of the GAR. Software had been developed to compare two GARs developed under alternative manpower policies. When used in combination, these packages provided a means to efficiently pinpoint the effects of the alternative manpower policies. This phase also included the identification and investigation of the allocation of free B-billets.

There were four factors that had significant direct bearing on the study and thereby changed both some of the objectives and some of the results. The first factor had a direct bearing on part (c), the comparison of automated and manual GAR development processes. This comparison was found to be infeasible to accomplish since all of the officers who had built the GAR manually had rotated

from HQMC by the time that the STRAFE output was being used and the study was initiated.

The second factor was the implementation of the Table of Manpower Requirements (T/MR) system that occurred simultaneously with the development of the STRAFE model. The output of the T/MR system had to be compatible with the STRAFE model, since it was used as input to the STRAFE model. This means that there was at least a beginning of a unified manpower requirements determination process.

The third factor was the deployability posture of the Marine Corps. The heavy overseas requirements were significantly decreased in the post-Vietnam era. This meant that a large rotation base within CONUS was no longer required.

The final factor that had an impact on the study was the change in the experience level of the operators by the time the study had finished. The users of STRAFE had several months of operational utilization of the model in production and had developed the official USMC FY 73 GAR authorizations. This means that the users were not completely new to this model and therefore comparisons between users could not be made as similar results could not be expected from another group of officers who had little or no experience with the model.

The "Conclusions and Results" of phase I of the GAR Impact Study are categorized by the 3 sections interviewed at HQMC during this phase. There were several themes that emerged from these interviews that still apply today and

several themes that have been overtaken by events. Themes that still exist today include a need for an educational document relating to the target force derivation process, the ability to run and compare different scenarios to support the primary users, and a desire for better communication and coordination between the manager and the users. The specific conclusions that were made are listed below by section:

MANPOWER MANAGEMENT INFORMATION SYSTEMS BRANCH

1. The current FYDP adjustment in the GAR derivation process should be replaced with an interface to the T/MR at the earliest possible date.
2. Special purpose GARs should be produced on a continuing basis.
3. The desirability of producing a quarterly GAR is questionable.
4. The need for an educational document relating to GAR derivation is critical.
5. The current GAR distribution list is probably adequate.

PLANS AND PROGRAMS BRANCH

1. Utilization of the RIP model requires transformation of Major Program Memorandum (MPM) categories or fiscal guidance categories into Table of Organization categories.
2. Since this section is not a user of the GAR, but rather provides input for the GAR, it can be eliminated from the distribution list.

ASSIGNMENT AND CLASSIFICATION BRANCH, ENLISTED SECTION

1. There is a very real need for personnel involved in derivation of the GAR authorizations to be aware of the subsequent impact of these authorizations on management of actual on-board personnel.
2. The FYDP adjustment in current GAR derivation should be replaced with an interface to the T/MR.
3. Only one USMC approved, fiscal end-year troop list should exist at any point in time.
4. Prior to production of a final year-end GAR, one or more preliminary GARs should be produced and staffed for comment.
5. During periods of strength adjustment, a mid-fiscal year GAR should be produced in addition to the traditional one reflecting year-end authorizations.

MANPOWER MANAGEMENT INFORMATION SYSTEMS BRANCH

It should be possible to interface GAR derivation with the T/MR process by end of fiscal year 1972.

TRAINING BRANCH

1. GAR authorizations play a key role in determination of quotas for ground formal schools and basic specialist training.
2. Users of the STRAFE model should consult with the Training Branch personnel when deriving sharing coefficients to be utilized in the spread of an enlisted careerist training line.

PERSONNEL PLANS AND PROGRAMS BRANCH, OFFICER SECTION

1. There is an urgent need for a separate GAR applicable to limited duty officer personnel.

2. Officer end strength and corresponding unrestricted and LDO field grade GAR authorizations are constrained statutorily by a process that does not consider officer structure requirements.
3. Excessive use of 9910, 9911 and 9912 billet designators has compounded the problem of deriving a meaningful GAR for unrestricted officers.
4. Officer GARs applicable to selection board convening times could be profitably utilized by this section.

***PERSONNEL PLANS AND PROGRAMS BRANCH, ENLISTED
SECTION***

1. The Ground/Air partition of estimated accession requirements is based on GAR authorizations.
2. Reenlistment goals by Occupational Field are based on GAR authorizations.
3. Promotion objectives are based on the NAR instead of the GAR.
4. The GAR provides the basis for inventory monitorship, and, thereby, the basis for lateral movement and early-out programs.
5. An out-year GAR would be helpful for accession planning, whereas quarterly GARs would be useful only during periods of radical strength adjustment.

***ASSIGNMENT AND CLASSIFICATION BRANCH, OFFICER
SECTION***

1. The assignment of skills to unrestricted officers graduating from TBS is based on current GAR authorizations, rather than out-year authorizations which would be more appropriate, but which are currently unavailable.
2. This section could profitably utilize an Officer Availability Digest, specifying by grade and skill, the officer inventory, GAR authorization and authorizations dictated by the Authorized Strength File.

C. CURRENT PROCESS

The current process for developing the GAR has remained the same in theory but has changed dramatically in terms of both procedures and hardware. As previously mentioned, the GAR was the output of STRAFE. However, in the mid-1980s, the Target Force Planning Model (TFPM) replaced the STRAFE model and this title more succinctly described the goal of the model. The name of the output of the model was then changed from the GAR to the Target Force though it stills describes the ideal force by grade and AMOS. (TFPM User's Manual, 1986)

The original STRAFE model resided on a commercial mainframe. Updating the ASR and the model manager's dictionary was accomplished through the submission of change cards to update the magnetic tapes on which the information resided. The manager had to keep track of which tapes were the most current and what changes had been requested.

In the early 1990s, the model was moved to an IBM RS6000 that runs UNIX in a client-server arrangement. The model was physically downsized with respect to hardware and, unfortunately, the capabilities of the model were also changed. The earlier model contained a COMPARE program that allowed the model manager to compare different outputs. This feature could not be incorporated in the new model due to cost considerations. Since then, according to the contractor, limited funding has caused further deterioration of the model

over time, resulting in the loss of features and a lack of current documentation.
(See Appendix G)

Currently, the model is moving to a Windows NT server that accesses an Oracle database. The hardware that will be used will be a Hewlett-Packard server and the user's personal computer. This is a nothing more than a shift in hardware and will not affect the model or the process.

The inputs to the current process as shown in Figure 1 remain the Authorized Strength Report (ASR) and the model manager's dictionary. The Total Force Structure Division (TFSD) at the Marine Corps Combat Development Command (MCCDC) develops the ASR. The ASR is a computer generated report indicating the MOS and Grade billet mix which has been programmed for the Monitored Command Codes (MCC) at a specific point in time.

The size of the ASR is constrained by DOD approved fiscal and end-strength limitations. The billets in the ASR are a subset of the Table of Organization (T/O) billets. The ASR contains both A and B billets. An A-Billet is a job in a Marine organizational structure defined in the Table of Organization (T/O) with a billet description and a 4 digit MOS. Ideally, it requires staffing by a Marine with a specific matching AMOS and is always associated with a grade requirement. A B-Billet is an organizational billet requiring a skill that is not necessarily unique to any AMOS. The staffing of B-billets is allocated to the population of AMOS Marines.

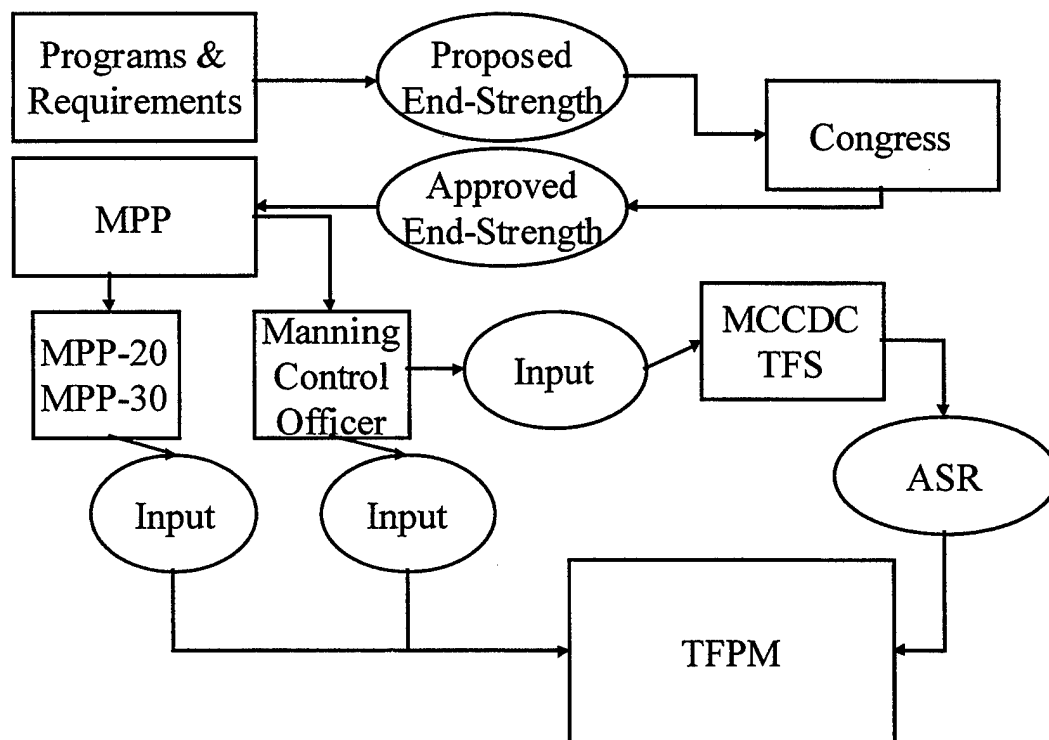


Figure 1. TFPM Input Process

The ASR does not report on Individuals, that is, Marine Corps personnel who, temporarily due to their status, do not contribute to mission accomplishment. This category includes patients, prisoners, transients, and trainees. However, these Marines must be accounted for somewhere in the manpower planning process since all Marines have a grade, skill (MOS) and location (MCC). These Individuals will presumably return to the force after their schooling, training, or transient status is complete. The exception is the prisoners who will most likely leave the force.

The second major input to the TFPM is the model dictionary. The dictionary consists of 27 spreadsheets that specifically address the myriad of requirements that the TFPM must satisfy to reach the Target Force. The model manager is responsible for maintaining the dictionary. Many of the sections of the dictionary are not used as the policies that they supported have become outdated. The sections of the dictionary and a brief description follow:

1. **Deprivation Definition:** This sheet defines deprivation by MOS. When a MOS does not have enough CONUS billets to balance the population overseas rotation, the MOS is said to be deprived. Originally, the model was designed to balance overseas tours with continental U. S. (CONUS) tours; however this part of the model is not currently used.
2. **EFMS Targets:** The Enlisted Force Management System (EFMS) provides manpower targets by grade for various enlisted skill categories. EFMS attempts to create manpower targets so that goals such as equitable promotion and an attainable career path exist. This part of the model is no longer used.

3. **Manning Modification:** This sheet allows the model manager to modify the ASR input file and would be used in the case of a unit that comes on or off line between trooplists. The trooplist is a planning document that arrays the structure of the FMF organization of the Marine Corps, by unit, for a specific point in time. This sheet is not used at this time.
4. **MCC/PMCC Definition:** This sheet allows the model manager to modify the ASR input file and is used in the case of a unit changing locations between trooplists.
5. **Notes:** This sheet allows the model manager to annotate internal notes concerning the Target Force.
6. **Type 2 Manning:** This sheet allows the model manager to delineate differences between regular officers and limited duty officers. This section is not used for enlisted runs.
7. **Enlisted B-billet Plan:** This sheet allows the model manager to specify which B-billets are attributed to which AMOSs. This can be done using percentages or raw numbers. An alternative is for the model to provide an optimal solution.
8. **Enlisted Exclusion:** This sheet allows the model manager to exclude MOSs from categories in which they do not fall. For example, the model manager is not attributing any B-billets to training MOSs, since trainees are not eligible for those types of duty.
9. **Enlisted Group Definition:** This sheet allows the model manager to group MOSs. Some groups of MOSs can be treated in a similar manner by the model, as the behaviors of those groups are relatively the same for modeling purposes. An example of this grouping would be the Occupational Field 03. Basic infantrymen (0311) and machine gunners (0331) have similar skills and training pipelines so they can be grouped together to facilitate modeling.
10. **Enlisted Individuals Grade Split:** This sheet allows the model manager to allocate percentages of transients, patients, and prisoners to particular MOSs and grades.

11. **Enlisted Individuals Totals:** This sheet displays the total number of transients, patients and prisoners. Individuals in a training status are displayed on another worksheet.
12. **Enlisted MOS Definition:** This sheet defines the MOSs for the model. It specifies whether an MOS is primary or non-primary, the low and high grade, and to which skill family and EFMS family it belongs.
13. **Enlisted NAR/GAR Limits:** This sheet allows the model manager to allocate the Numerical Adjusted Recapitulation (NAR) and GAR minimums and overage weights by grade to the MOSs.
14. **Enlisted Target Force Constraints:** This sheet displays the end strength limitations placed on the model. MPP provides those limits to the model manager.
15. **Enlisted Training MOS (T):** This sheet contains the total number of individuals in a training status by grade, MOS, and type of training (entry- level or careerist). MPP provides this data to the model manager.
16. **Enlisted Transients, Patients, and Prisoners:** This sheet allows the model manager to allocate the transients, patients, and prisoners to specific tour types by MOS or group and by grade.

Sheets 17 through 26 are similar to sheets 7 through 16 except that they provide information and are used for modeling the officer, rather than the enlisted population.

The Target Force is the final output of the TFPM. It represents a desired grade- adjusted Marine Corps personnel inventory by AMOS and grade, incorporating the result of all B/non-primary billet and individuals line allocations to the AMOSs and grade structure. It is also known as the GAR. The Target Force, then, is the sum of the ASR and Individuals that have been attributed to primary

MOSs and adjusted by grade. (See Appendix G) Figures 2, 3, and 4 describe the flow of the output from the model manager through the primary users to the secondary users.

D. SUMMARY

By manipulation of the information sheets in the model dictionary described above, the model manager can run different scenarios for manpower planning. As noted, however, several sheets that would allow additional scenario development are not used for one reason or another.

Thus, the TFPM generates a Target Force that supports the manpower requirements for the Marine Corps. It is a model that has evolved over 25 years in terms of both hardware and software development from a mainframe computer to a client-server arrangement while still retaining the principles on which the model was originally based.

There are, however, still some areas that need improvement. Many of these are the same areas that manpower planners identified in 1972. The interviews conducted as part of this thesis identified these areas. The next chapter, Chapter III, will present the major themes of the interviews.

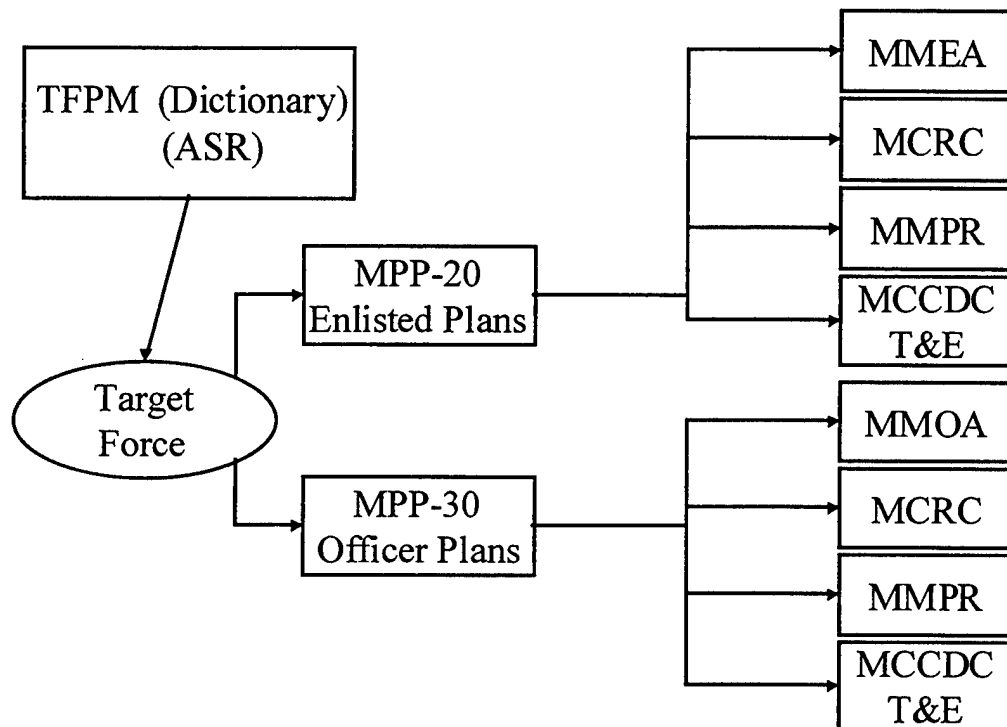


Figure 2. TFPM Output Process

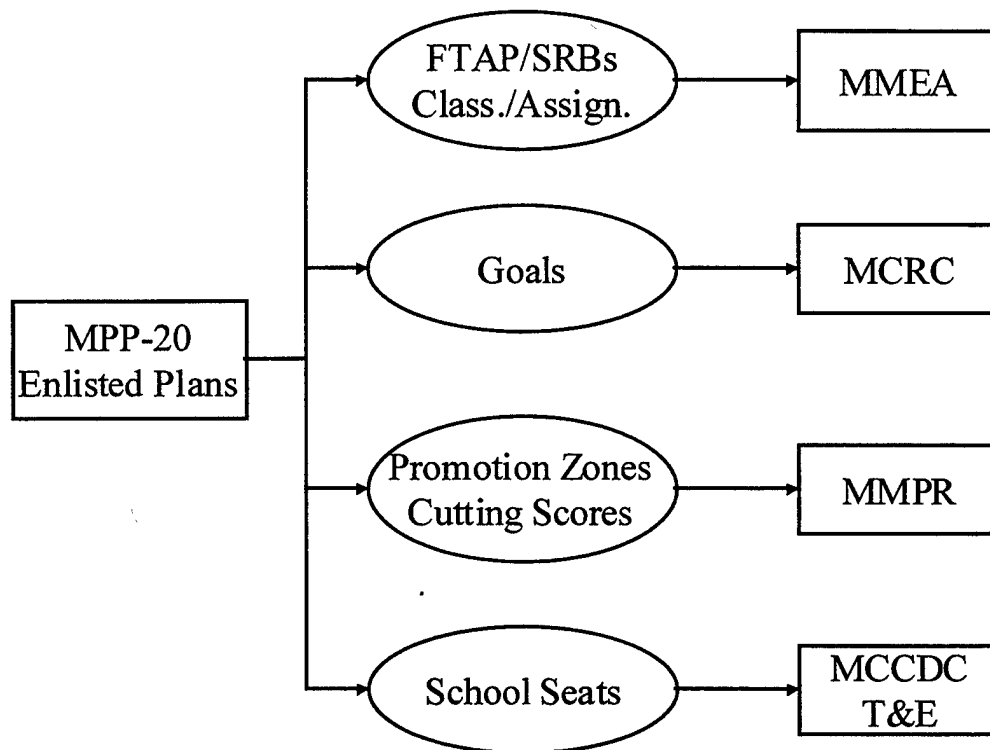


Figure 3. MPP-20 TFPM Output

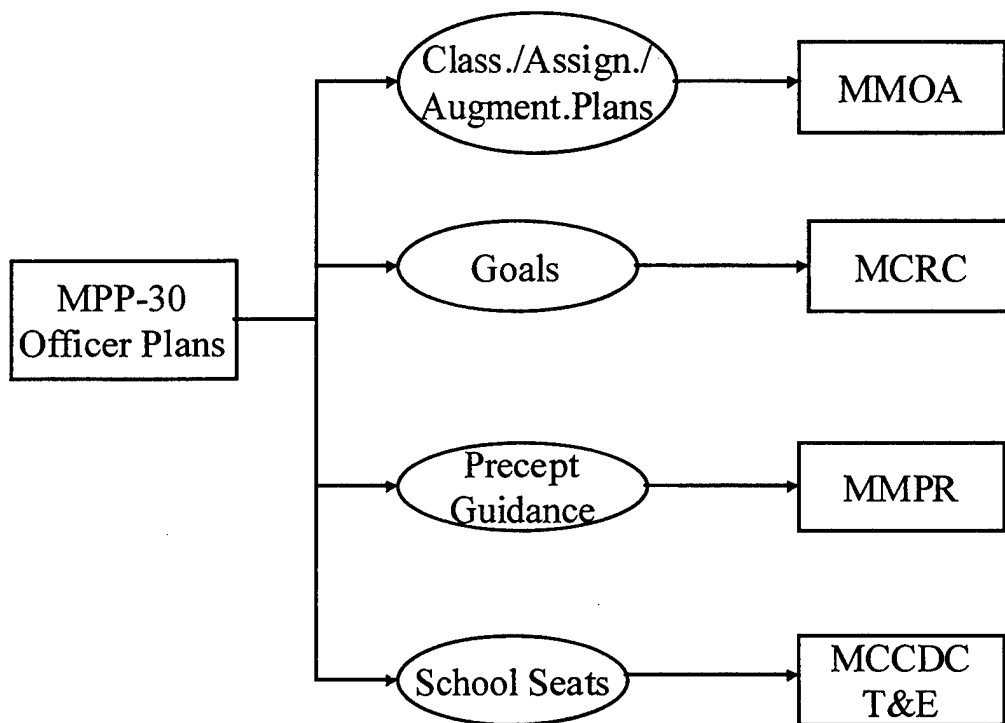


Figure 4. MPP-30 TFPM Output

III. MAJOR THEMES

A. INTERVIEW PROCESS

Interviews were conducted with the model manager, the contractor, the Individuals planners, and representatives from the Officer and Enlisted Plans Sections. The media used were videoteleconference (VTC), telephone, and electronic mail. Prior to the interviews, regardless of the medium used, a list of questions was sent to the interviewees so they could be prepared. Two sets of questions was used and are provided as Appendix K. The first set of questions was primarily for the model manager and the contractor. These questions focus specifically on the model, its underlying methodology and the development process. The second set of questions was concerned with the interaction of users with the model and its output. Both sets of questions was sent to everyone as to allow input from the manager, the contractor or the users on both the model and its use.

The interviews with the model manager, the contractor, and all of the primary users except one were conducted via VTC. The first VTC included the contractor and the model manager. The contractor, DSAI, developed the STRAFE model and conducted the original GAR Impact Study. The model manager and contractor were interviewed together as the contractor is the corporate knowledge of the system and the model manager is the current expert. They work very

closely together on the model so a joint interview was logical and proved to be productive as they could clarify information and processes.

The second interview was with the Individuals planners. These planners provide the most input to the model manager for the dictionary. Individual planning also tends to be the area that has the greatest variance from year to year and can thereby significantly impact the total cost of Marine Corps manpower. The third VTC interview was with the Officer planner. The final interview was via telephone and electronic mail with the Enlisted planner. There is a significant difference in size between the officer and enlisted population. The officer population is approximately 18,000 and the enlisted population is approximately 154,000.

The VTC provided the richest medium possible for the interviews. Logistically, it was difficult scheduling a common time for both VTC rooms and the different participants but nearly everyone shifted their schedules around to accommodate one another. There was an inherent advantage to using the VTC instead of the face to face interviews as each interview could be videotaped. They could then be reviewed as often as necessary to ensure all pertinent information was obtained. I was able to videotape each interview and review it after each session as many times as I needed. Using phone conversations exclusively would have limited the amount of information that could be exchanged. Using electronic mail exclusively could have caused the users to sanitize the answers

and would not allow for emotion to also be recorded. A combination of these media provided the best available data collection for this thesis.

B. MAJOR THEMES

Throughout the course of the interviews, several major themes were identified. Some were common throughout all the interviews while others were restricted to individuals. All of these themes have a significant impact on the effectiveness of the model and its output.

1. Lack of Integration

The first and possibly the most important of these is the apparent lack of integration within M&RA. According to Sampson in Managing the Managers, integration is much more than coordination. It involves creating a "complete and more perfect whole, working together cooperatively to realize common goals." (Sampson, 1965, p. 145)

The lack of integration was noted by each of the interviewees. The model manager and the contractor noted that the integration duties had in the past been performed by Mr. James Marsh, by virtue of both his corporate knowledge and his position as the Assistant Deputy Chief of Staff (DC/S) for M&RA. Upon his retirement, it appears that major organizational changes and an increased work tempo detracted from the deliberate integration of the process.

Closely related to the lack of integration is a lack of communication between sections. The interviewees noted that although communication occurs,

there is no scheduled dialog to discuss current issues or goals. As noted by the Commandant of the Marine Corps in his planning guidance,

the principal challenge facing the Marine Corps today lies in continuing to fulfill its charter as an expeditionary force in readiness with a leaner force structure and with fewer Marines. (CPG, 1996)

This lack of structured communication can make the working environment become strained over time and instead of making small course corrections, the planners could have to deal with serious problems. This applies not only to the operational forces but to staff agencies such as M&RA, who must support the same infrastructure with fewer personnel.

2. Organizational Structure Changes

The organizational structure had also changed drastically during this period according to those interviewed. MPC was broken up with the ASR Manager moving to the TFS Division in MCCDC in Quantico. This situation contributed to the construction of not only an organizational barrier but also a geographical barrier between the managers. The TFPM manager became part of the Officer Plans section in MPP administratively but operationally supported all the sections in MPP. (See Appendices D, E, F)

3. Funding Support

Another significant theme is the trend towards decreasing financial support for the models that support manpower planning. This mirrors the current efforts to downsize the military in terms of both force structure and personnel. As the size

of the operating forces decreases, the infrastructure required to support those forces is also being downsized in terms of both funding and personnel. The manpower planning organization and its models are no exception.

4. Documentation

The documentation of the TFPM has also suffered because of the decrease in funding. Documentation is traditionally one of the first casualties of a small or decreased budget. This is largely a result of systems changing too quickly for the developers to maintain documentation (App1).

The documentation that does exist for the TFPM seems to be available only to the model manager and the planners with no overarching document that spells out the process, the players, and their roles in the development of the target force. While desktop procedures and turnover files are critical for the individuals involved in the process, there is no clearinghouse for information to ensure that the information is correct or that the individual processes are supporting the development of the target force.

5. Measures of Effectiveness

Finally, and perhaps most significant, the measure of effectiveness as to whether the TFPM is actually a good planning tool is very qualitative and generic. There are no concrete measurements that relate the performance of the model to the future force or the current force. The only real test of the model is whether or

not the current manpower plans can be executed by MM. While this is certainly a requirement, it is very generic and focused on the near term versus the long term.

C. SUMMARY

The major themes in this chapter are a lack of integration, organizational structure changes, a lack of funding support, minimal documentation, a lack of documentation for the model and the process, and a generic measure of effectiveness. The next chapter, Chapter IV, will comment on these themes and will provide recommendations for the Marine Corps to address these themes.

IV. CONCLUSIONS AND RECOMMENDATIONS

The TFPM appears to be an effective model for the development of the target force considering the very generic nature of the performance measure and in spite of several challenges that exist for the model manager and the primary users. This is one model and one set of processes but it may be indicative of other systems and processes within manpower in the Marine Corps.

A. INTEGRATION

The model manager and the planners in MPP work within their areas of concern and only communicate and coordinate as needed. There is no overarching organizational director or team that formally integrates this model and these processes into the rest of the manpower process.

Manpower Analysis (MA) was originally the branch responsible for coordination and integration within M&RA and with outside organizations (Refer to web page). That branch has recently been absorbed by MPP and has become part of a new section. MPP-50 is now the Manpower Integration and Analysis Section. (See Appendices E and F)

There have also been other significant organizational changes in the past ten years that have affected the TFPM and the process for developing a target force. While these changes have placed the model manager in MPP with the planners that he supports, it has organizationally and geographically isolated him from the other model managers in the process most importantly, the ASR

Manager. This could have a detrimental impact since the ASR is one of the two major inputs to the TFPM. The model managers have been working to minimize the impact of these changes but it is crucial that they continue to communicate to minimize problems.

M&RA continues to change as an organization. During this period, they should establish an integrator or integration team for the entire department. They have apparently established integration sections within the branches which is a step in the right direction. The integrator, whether it is an individual or a branch, must have a global view of the entire process.

Ideally, it should fall within the office of the Assistant DC/S for M&RA and be able to impact processes and decisions where it resided in the past. It would be difficult for the new integration section in MPP to act as the integrator for the department. This arrangement could undermine the other integration sections, and give the planning process an unequal voice in the development of processes within the department.

This new integrator or integration team must act as a clearinghouse for information that supports the TFPM, the processes within MPP, and on a larger scale, the rest of the manpower processes. As a first step, the integrators should validate and document the entire system and should concentrate on the interface between different models and processes. They should ensure that the manpower processes are looked upon as a system instead of several individual processes.

This would be a massive undertaking and could prove to be very expensive, but with the amount of money and effort currently dedicated to manpower, it would prove to be cost-effective in the long run. Until the current system is thoroughly documented, no further changes should be allowed.

B. MEASURES OF EFFECTIVENESS

There is not a concrete measure of effectiveness for the TFPM. It is certainly important that MM be able to execute the manpower plans they are given by MPP using TFPM output, but that alone should not be the measurement for whether or not the target force is the "correct" desired force. Analysts outside of MPP do not evaluate the model, and those that evaluate it within MPP are looking for the bold exceptions or variations from previous runs. While this will keep everyone on generally the right track, M&RA appears to be "riding instead of driving."

Concrete measures of effectiveness must be established for the model by the integrator or integration team for M&RA. While noting variation may provide short-term safety, it does not establish a standard to which the model should perform. Once the total system has been reevaluated, establish quantitative measures that evaluate the relationship between the projected force and MM's capability to execute their plans. Decisions should not be solely based on this information, but will certainly enable the leaders to make the best decisions.

C. DOCUMENTATION

There has been a serious decrease in the financial support for the model. This decrease is apparently throughout the M&RA department, and for that matter, the Marine Corps as a whole. It has resulted in both a decrease in the capabilities of the model and a decrease of documentation for the process and the model.

This lack of documentation is compounded over time as well meaning people attempt to change systems and organizations without having an accurate picture of the situation. An accurate diagnosis of the current situation, organization, or process, is required to identify the correct solution.

Documentation is necessary and a good investment. As stated by Grinold and Marshall (1977):

It would seem obvious that responsible policy makers and model builders would understand and explicitly document any planning methods adopted by their organization. All too frequently the authors have found that computerized manpower planning models are adopted without either proper understanding or documentation. After a few years of use the model becomes part of an established system. Nobody understands what it does or why, but because it gives reassuring numbers printed cleanly on that paper with holes down the sides, it is somehow to be believed and the number defended vigorously. Careful documentation is necessary as a record of the logic and methods used. But just as important is the fact that it forces the model builder to think through what he has created and be able to explain it to others.

While M&RA may not have reached the critical point that the authors refer to in the above quotation, it could slide into that position easily if significant steps are not taken soon. The authors refer to an individual model, but it would not take

long until an entire system is affected. This makes the situation that much more critical.

D. EDUCATION

Education is a critical link in the system. Not only must the Marines in M&RA learn their own jobs, but just as importantly, they must learn how their jobs interact with the rest of the manpower process. This thesis provides only a starting point and should be expanded upon by the integrators in M&RA.

All of these recommendations are dependent upon one another and should be implemented together. They represent steps to take M&RA closer to viewing the manpower processes within a systems approach framework. The TFPM is certainly providing, at a minimum, an adequate Target Force. It could be that the TFPM is providing the best Target Force for the Marine Corps, but without more robust integration, a concrete measure of effectiveness, better documentation, and system education, the full potential of the model cannot be accurately determined.

APPENDIX A. GLOSSARY

A-Billet: A job in a Marine organizational structure defined in the Table of Organization (T/O) with a billet description and a 4 digit MOS. Ideally it requires staffing by a Marine with a specific matching AMOS; always associated with a grade requirement.

AMOS: An MOS which can be carried by a trained Marine as his primary MOS.

ASR: Authorized Strength Report- a computer generated report indicating the MOS and Grade billet mix which has been programmed for the Monitored Command Codes (MCC) at a specific point in time. The size of the ASR is constrained by DoD approved fiscal and end-strength limitations. The billets in the ASR are a subset of the T/O. The ASR contains both A and B billets. The ASR is an output of the Manning Level Process (MLP).

B-Billet: An organizational billet requiring a skill that is not necessarily unique to any AMOS. The staffing of B-billets is allocated to the population of AMOS Marines. Examples are drill instructors, recruiters, guards, and rifle range instructors. It may also be known as a universal billet, especially for officers.

BMOS: A four digit MOs designator which indicates a skill not included among the primary skills for which a Marine can be trained. Always associated with a grade requirement. Certain BMOSs may be carried as additional MOSs by Marines trained in those skills. Drill instructor and recruiter are examples of such additional MOSs.

Deprivation: This term originates from a requirement that Enlisted Overseas unaccompanied tours must alternate with CONUS tours. A sufficient number of CONUS billets within an MOS must be present to support this rotational requirement to ensure a reasonable length of time spent in CONUS. Where insufficient CONUS billets exist within an Enlisted MOS, the MOS is considered deprived, or that deprivation exists.

GAR: Grade Adjusted Recapitulation; describes both the process and the outcome of the last stage of TFPM processing, that is, adjusting the NAR (raw billets and individuals lines) to meet the specified grade constraints. The resulting GAR is also known as the "Target Force". It is arrayed by AMOS and grade.

Individuals: Marine Corps personnel overhead which, temporarily, do not contribute to mission accomplishment. They include patients, prisoners, transients, and trainees. They must be accommodated in the manpower planning process since all Marines must have a grade, skill (MOS) and location (MCC).

MCC: Acronym for "Monitored Command Code", a 3-digit administrative code for a specific geographical location to which personnel are assigned by HQMC.

MLP: An acronym for the Manning Level Process model. The MLP takes the billets in a selected array of organizational T/O's representing the Marine Corps and reduces them to a subset of programmed billets.

NAR: Numerical Adjusted Recapitulation. The total Grade and MOS requirements of a specific structure, reduced to the programmed strength level. The NAR is composed of program raw billets and the individuals line. The NAR show the "correct" number of manpower spaces for a specific troop list but many not show the correct grade distribution.

Primary MOS: The MOS for which a Marine has been trained. It is a primary personnel management data element.

Structure: Simply stated, structure is the billet organization to accomplish the assigned mission. At the organizational level, structure is the Table of Organization (T/O). Structure has as its components Grade, MOS (skill), and unit designation. A structure billet does not always imply intention to fill it with a trained Marine.

Target Force: The Target force is the final output of the TFPM representing a desired grade adjusted Marine Corps personnel inventory by AMOS and grade. It includes the result of all B/non-primary billet and individuals line allocations to those AMOSs. It is also known as the GAR.

T/MR: The Table of Manpower Requirements. It is the automated system which contains all Marine Corps T/Os- regular force, reserve force, FMF and non-FMF, and planning T/Os. The Table is updated periodically. Contained within are T/Os for peacetime and wartime use.

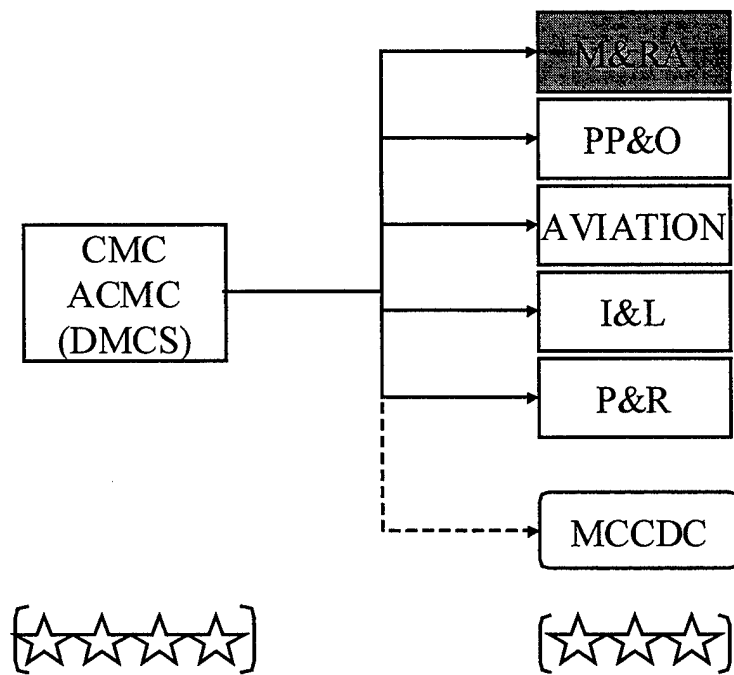
T/O: Table of Organization. A document which prescribes the mission and validated structure requirements of a unit and contains grade, MOS, and description for each of the billets. It is the basic document that describes in billet line detail the composition of every Marine unit. The sum of the approved regular

and reserve T/Os forms the basis for all subsequent manpower plans. Structure planning utilizes designated planning T/Os.

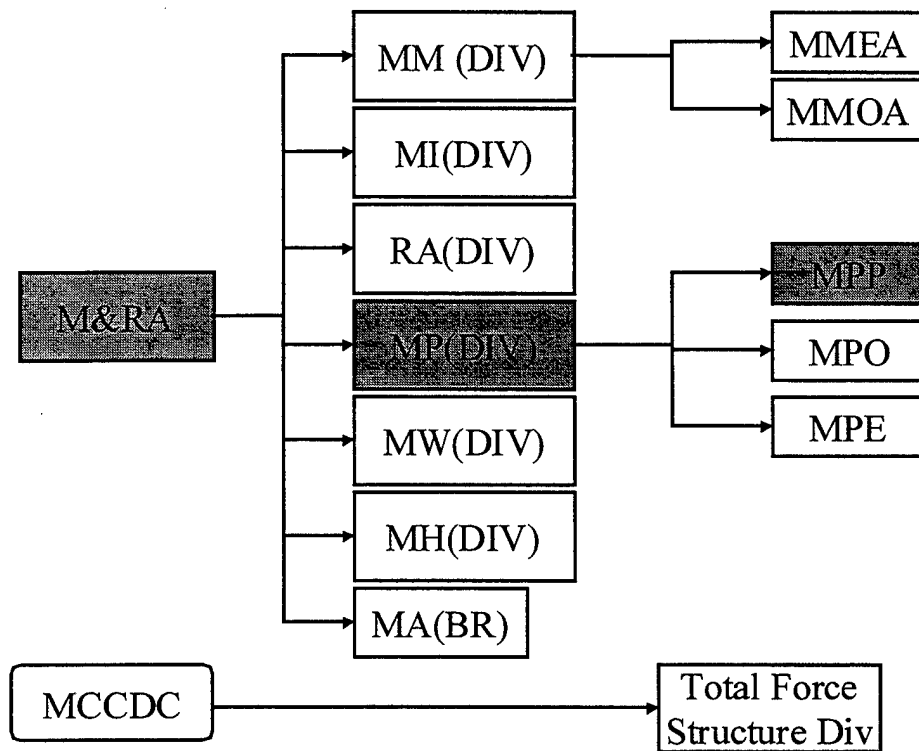
Trooplist: A planning document which arrays the structure of the FMF organization of the Marine Corps, by unit, for a specific point in time.

(This glossary is a subset of the glossary from the 1986 User's Manual for the TFPM)

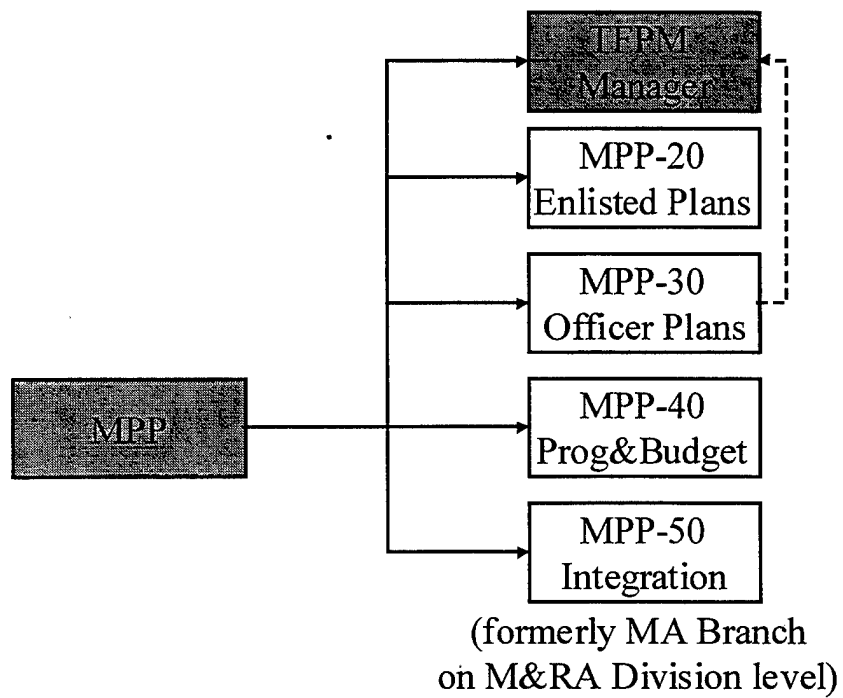
APPENDIX B. MARINE CORPS STAFF



APPENDIX C. M&RA (DIVISIONS AND BRANCHES)



APPENDIX D. MPP (BRANCH AND SECTIONS)



**APPENDIX E. INTERVIEW WITH THE MODEL MANAGER AND
THE CONTRACTOR – MR. ROBERT BROWN AND
MR. ROD MORTON**

The first VTC included the contractor and the model manager. The contractor, DSAI, conducted the original GAR Impact Study. I decided to include them with the model manager since the contractor is the corporate knowledge of the system and the model manager is the current expert. The model manager and the contractor work very closely together on the model. The model manager ensures that the model adheres to the current manpower policies. These policies include those dictated from DOD, DON, and current Marine Corps policy. The contractor makes recommendations to the model manager as to the best means of implementing the changes.

The model manager for the TFPM manages a unique model. The TFPM produces the target force. These figures are passed to MPP for planning purposes. The planners use these figures to determine requirements for accession, retention, reenlistment bonuses, promotion board guidance, assignment of MOSs, and training requirements. The TFPM manager is not involved in any of these processes. He is independent of these other processes and is strictly concerned with production of the target force, which is unlike other model managers.

Other model managers are generally running a model that is used in the sequence of a manpower process. An example of this is the ASR, which is used as input for the Staffing Goal Model (SGM), which in turn is used as input for the

Enlisted Assignment Model (EAM), which in turn is delivered to the monitors as recommendations for assignments. If these assignments are acceptable to the monitors, then their acceptance can trigger orders to be written automatically in the Automated Orders Writing Process (AWOP). This independence is significant in the model manager's relationship with the primary and secondary users. The dependent relationship between them does not exist to the same degree.

The model manager and the contractor both noted a significant loss in interface between the model manager and the primary and secondary users. The current situation is informal and not very effective in their opinion. At one time the Deputy Chief of Staff (DCS) for M&RA was the integrator in the department. While I do not believe that there was any written direction for that particular billet, the DCS was the integrator. There is currently an integration void. In fact, the head of Officer Plans in MPP has become the head of an integration team to fix this problem.

Integration in M&RA is particularly critical. There are several models that work together, either in parallel or in series, and inconsistencies could be embarrassing at best and disastrous at worst. The ASR, for example, is the primary input to the TFPM and it is also the primary input to the Staffing Goal Model that is a list of the billets that will be staffed by the current inventory.

This means that the ASR is being used in planning for the current and future inventories. These are two completely different processes in M&RA. The

management of the current inventory is conducted in the Manpower Management (MM) division. The management of the future inventory is conducted in the Manpower Plans and Policies (MPP) division.

There is a very complicated relationship between those two processes. The ability of the MM division to fill the billets derived from the (current?) ASR is directly related to the effectiveness of the planning process performed by the MPP branch. The current inventory is the result of previous planning decisions including accessions, reenlistments, augmentations, promotions, and other functions that are addressed in the planning process.

The extent of the effect of decisions in the planning process is difficult to measure and that makes the role of integrator that much more critical. There are few, if any, who understand the entire manpower process. The integrator must be one of those few or perhaps the process is too big for an individual to manage. Maybe there should be an integration team that can look at the entire process. Maybe there should be an integration team in each of the branches in M&RA with an M&RA integration team above them. It was clear from the interview that there is currently a lack of integration in M&RA. The TFPM is affected by this problem because it extends throughout the entire manpower process.

Another potential problem is the current organization that relates to the TFPM. The model manager's line number is on the Table of Organization (T/O) under the Officer Plans section in MPP, but he does not work for the head of that

section. He works for the Head of MPP, but works closely with the heads of Officer and Enlisted Plans in MPP. This awkward structure is the result of the division of the MPC section in the early 1990s.

MPC contained the planning models including the TFPM or GAR, the ASR, the troop lists and the T/Os. The TFPM manager stayed in the M&RA department in MPP, while the rest of the section transferred to Quantico to become part of the TFS Division at MCCDC. The rationale was that MCCDC was responsible for Requirements, and this section represented manpower requirements.

This was a major organizational change that still has negative effects on the TFPM. A change in organizational structure is difficult by itself but more difficult when combined with a geographical distance of 30 miles. Communications were strained, as was the subject of process ownership and responsibilities.

A current problem with the model is the lack of financial resources to support the model. This is probably not a problem unique to the TFPM and has probably effected all of the modeling support in manpower. With limited resources, the model manager has made difficult decisions concerning capabilities of the models, documentation to support the models. With dwindling resources and the decrease in manpower requirements, justification for increasing or even maintaining the current requirements becomes difficult.

The reduction of the capabilities of the model is another consequence to the reduction of resources. The model's capabilities have decreased as the financial support has decreased. This problem increases the requirement for the model manager to perform analysis. This analysis was built into the model into the early 1980s.

The newer version of the model does not contain these analysis tools and the model manager writes ad hoc programs to evaluate the output. These programs tell the model manager the differences but not why the differences occurred. This feature was present in the earlier model. Now the model manager has to wade through output to perform analysis.

Unfortunately, the decreasing requirement in total numbers dictates an even more efficient use of the manpower process and the models that support the process. The depleting resources must be employed as efficiently as possible. The use of models and the requirement for accurate documentation should be increasing as the requirement for optimal solutions increases. Furthermore, as we decrease the resources that support the models, the models are used less frequently, the model managers lose some of their expertise, and the solutions that are generated by the model are less supportive of the process.

The lack of documentation for the models is not only from the lack of resources. One reason for this is the rapid changes in hardware. The current trend for support of software is away from documentation, especially in its paper form

and towards thin manuals and electronic or on-line help. Furthermore, in the acquisition of (computer) products, when funding is cut, supporting documentation is frequently one of the first items in the project to be sacrificed. The model manager requests the documentation every year but its relative priority causes it to be below the funding line. The model manager noted the high cost of a technical writer as one of the main reasons that the documentation costs are prohibitive.

A key point in the documentation requirement is the fact that while the hardware requirements have certainly changed in the past 30 years, the process has remained basically the same. Policies have changed and the level of specificity for most of the descriptive categories have changed but the process of creating the target force has remained relatively unchanged. The documentation variance, then, is the change that has taken place for the hardware over time. This is certainly significant for the contractor and possibly the model manager, but the primary and secondary users are looking at a similar product.

The model manager and the contractor agreed that the primary benefits of the TFPM are that:

1. It allows time for analysis instead of spending the time running the model,
2. It allows for gaming solutions rather than cumbersome calculations,
3. It is more responsive to input changes, and
4. The model is now located locally on a central database instead of a remote site.

These benefits can be highlighted by a comparison between the models over time. For example, early on the model was driven by a card deck that had to be punched and then ran through a computer. This was a very delicate process. Eventually, the model was on tape, but changes to the tape had to be made to effect a change to the model. This also took a lot of time and involved keeping a good inventory on the current tapes in use and ensuring that the tape with the most recent changes was the one being used during the execution of the model. Now the changes can be made and the model can be run from the desktop. Now the time delays are caused not by the model, but by the policy makers making decisions.

There are several parts of the model dictionary that are not currently used. This has occurred over time as policies have changed or have been overcome by events. An example of this is the deprivation. Early on in the life of the model when there was a large requirement for overseas billets, the deprivation portion would protect MOSs from drying up due to a lack of billets in the CONUS. Since the early 1980s, the requirement for overseas billets has decreased to such a level that protecting MOSs is no longer necessary.

**APPENDIX F. INTERVIEW WITH INDIVIDUALS PLANNERS-
MAJOR GREGG HABEL AND CAPTAIN MARK
ZINNER**

My second interview was with the planners that calculate the Individuals for the Enlisted and Officer Plans sections and in the aggregate. The Individuals planner for the aggregate was on the T/O under the Programs and Budget Section of MPP, but he has now become part of the newly established Integration section in MPP.

The only educational program available to the incoming staff officers was the "Manpower 101" course that was offered until the mid-1990s. That course had been developed by the Assistant DC/S for Manpower, Mr. Marsh, who was also the integrator for M&RA. This class was given a few times a year and most officers went through it more than once. It lasted for two or three days and introduced everyone to the process in some detail.

Since then, some officers, particularly in MPP, have attempted to put together a computer-based tool to educate the new officers arriving at Manpower. This program, however, lacks the interaction that is necessary for a thorough educational process. While a graphic demonstration is certainly necessary, it does not fulfill the needs of the arriving staff officers, who in most cases, have never served in a manpower billet.

The planners also use some type of turnover file to educate the newly arrived staff officers and ideally would like a month of turnover time when the

replacements arrive. They also informally check each other's work; however, there is no formal check that is performed on the system. There is no clearinghouse that validates the information that is used by the planners or their products.

Both planners indicated that a communication gap exists within M&RA from their perspectives. Their opinions are certainly valid considering the number of sections with whom they deal. The Individuals consist of trainees, transients, patients, and prisoners (T2P2). In the best of circumstances, it would be remarkable if all the sections in M&RA that deal with these categories were using the same information.

The planners do not believe they are using the same information for several reasons, but that is not to say that this miscommunication is intentional. There are several moving parts in manpower process and several different levels of manpower education among the planners and those that execute the plans.

The most difficult calculation for these planners is for the trainees. The patients and prisoners are calculated using historical data based on past end-strength percentages. For the transient calculation, the planners obtain the Permanent Change of Station (PCS) plan from MM, and using those figures calculates a historical percentage that is applied to the future endstrength.

The calculation for trainees is more complex. The Individuals planners obtain information from the other planners on accession numbers and how that

number will be distributed by MOS. They then calculate total training times by multiplying those entering the various MOSs by the training times. They take into account the time awaiting training, attrition and other factors. The result is an average training time by MOS. Unfortunately, this calculation is in man-year averages and the conversion to actual individuals is not clean. (Get better explanation from Mark)

The Individuals planner has developed his own spreadsheet model to support the development of the Individuals line. His primary reference is DoD Instruction 1120.11, Programming and Accounting for Active Military Manpower. He does not use the output from the TFPM. He is strictly responsible for input. There is a problem with the input of the numbers of Individuals, particularly trainees, into the model. Currently, the figures are inserted by the model manager in the aggregate and also by the other planners for their separate calculations. These figures do not always match.

Some of the input for the TFPM also becomes the output. For example, the Officer planner submits the number of entry level lieutenants he needs to train to the model manager in the Individuals section of the TFPM dictionary. Those numbers are protected during the running of the model in the T2P2 line and the requirement for new lieutenants comes out as the same number that was submitted. The planners in MPP sometimes refer to it as the "incestuous nature of the GAR."

The only analysis of information in the TFPM done by the Individual planners is done using the output that the model manager provides to them. This is a comparative SAS program that identifies differences in the output based on percentages noted in the program. If a certain MOS has grown or shrunk by a certain percentage, the program notes it. It is a recent addition to the planner's tools for analysis of the output of the TFPM. This is the model manager's replacement for the COMPARE program that was discontinued from the model in the mid-1980s due to cost.

The Individual planners have not used gaming with the TFPM. This is a recent capability and gaming has been used in only some of the sections.

The B-billet plan has not been seriously reevaluated for the past ten years. The planners in MPP do not think that MMEA should be validating the enlisted B-billet plan. They are basing the B-billet validation on current inventory requirements. Apparently, control of the B-billets has migrated over the years between MPP and sections in MM. The current owners are MPP and a comprehensive review will take place in the spring of 1999.

The Enlisted Planners use the output of the TFPM for promotion, reenlistment, and accessions through a program plan. They develop a classification plan for the distribution of recruits in MMEA with the TFPM output. They develop a promotion plan that establishes the promotion zones and the cutting scores by MOS. They develop a reenlistment plan that establishes quotas

and reenlistment bonuses. This is called the First Term Alignment Plan (FTAP) and is given to a section in MMEA to execute.

APPENDIX G. INTERVIEW WITH OFFICER PLANNER - MAJOR GREGG HABEL

The third interview was with the representative from Officer Plans in MPP. Officer Plans and Enlisted Plans provide input to the TFPM as well as use the output from the TFPM. The end strength figure that is used in the TFPM is derived from Enlisted and Officer Plans.

Determining the end strength figure is another process. The Marine Corps proposes an end-strength through the POM working group, which is part of the PPBS. The Programs and Requirements Office translates that requirement into dollars. Once an end-strength is approved, that number is fed into the TFPM.

Officer Plans gives the model manager the breakout for officers by rank including unrestricted officers, limited duty officers, and warrant officers, which are identified as CAT 1, 2, and 3 respectively. The officer requirements and the highest enlisted requirements are controlled by DOPMA while the rest of the enlisted constraints are driven by Marine Corps policy. The TFPM is the only model that constrains by grade and that constraint is in the model dictionary.

That end strength number is also given to the Manning Control Officer who calculates the number of individuals in the aggregate. That aggregate number is given both to the TFPM manager and the TFS Division. How those numbers are broken out in the model are a result of input from Officer and Enlisted Plans.

The TFS Division uses that number for the Troop List Process, which eventually is used in the development of the ASR, which is the primary input of

the TFPM. The ASR is input for two processes. The first is the Staffing Goal Model, which is concerned with the current plan and current inventory. The other model is the TFPM that is concerned with the future plan and the future inventory.

Training is the most difficult input for the Individuals. The training calculation is done in man-years while the other calculations use billets. This differential becomes evident in the NAR line. There is a relationship between the two conventions, but they are different and distinct.

Another input to the TFPM is the B-billet plan. The B-billet plan assigns non-primary MOSs to AMOSs. Ideally, the specific requirement for the billet should be transmitted from TFS to the planners in MPP. The planners are responsible for this portion of input for the dictionary. The planners in MPP receive a list from TFS describing the B-billets relationship to other AMOSs as "necessary," "desired," or "anyone else will do."

Officer Plans uses the output of the TFPM for several different reasons that are similar to enlisted plans. The planners use the other lines of the output to check for blatant errors. There should be some kind of diagnostic that gives an explanation for differences. I think this diagnostic was part of the COMPARE program from an earlier form of the model. The only line that most of the planners use is the bottom-line, the Target Force number.

The first and simplest output that is used in Officer Plans is the Over/Balanced/Short Report. This report compares the current inventory with the

Target Force in two years. This report is used by the promotion planner to generate precept guidance for promotion boards and augmentation boards. Short MOSs could be given preferred status, *ceteris parabis*. Officer selection is not done by MOS, but this can be done on the enlisted side. The TFPM does not effect the officer promotion board numbers.

The TFPM output becomes part of a common database. The planners can go to that common database and look at the reports generated by the model. There are four reports. They are the Summary Report, the T2P2 Report, the B-billet report and the ??????? report. The summary report is the most used report by the planners. There is also an internal tool that compares the TFPM, the ASR, and the current inventory. It is a spreadsheet and is called the Dean's list after the planner that set it up.

The planners have their own definition of what over, balanced and short are. The rationale for this is that the different MOSs have different characteristics including training times, costs, and total sizes. The promotion section uses different criteria so that those given special treatment are kept to a minimum.

The TFPM is used in another important output. The Classification Plan determines how many lieutenants will be driven into different MOSs. The planner uses the TFPM that is two years out since that is the approximate length of time from the point that officer candidates are recruited to the time that they are effective. Generally, everyone is using the same Target Force for planning.

Another model that uses the output of the TFPM is the Officer Planning Utilization System (OPUS). This model takes TFPM output and breaks it down by years of service within the five categories of Fixed Wing, Rotary Wing, NFO, Law, and Ground officers. It is a Markov model.

The only ability that the planners have to directly influence the current officer inventory is by lateral moves, which can be forced or voluntary, and precept guidance. This highlights the importance of establishing a stable force at the beginning of the process. The effects of miscalculations on the part of the planners can be found years later.

An organizational change has recently occurred in MPP. The head of Officer Plans has become the head of a new integration section in MPP. This section includes the Manning Control Officer and four operations analysts that were formerly in the Manpower Analysis section. These analysts worked for the Assistant DC/S, who in the past had been the departmental integrator. This integration team includes the TFPM manager.

APPENDIX H. INTERVIEW WITH ENLISTED PLANNER – MAJOR JOE VANSTEENBERGEN

(This was not an interview. I sent some questions to Maj. Vansteenbergen and he sent me back the responses through e-mail.)

The Enlisted Plans Section (EPS) deals with a much larger population than the Officer Plans Section. There are four planners in the section including the First Term Planner, the Career Force Planner, the Promotion Planner, and the End-Strength Planner. They each provide input to the TFPM. The First Term Planner determines the number of school seats by AMOS needed by recruits entering the Marine Corps. Those numbers are converted to man-years and are used in the TFPM as the input for the training portion of Individuals. These numbers are primarily in entry-level MOSs.

The Career Force Planner determines the number of school seats required for Marines making lateral moves to alternate MOSs. That number is converted to man-years and submitted to the TFPM as another part of the training input for Individuals. The promotion planner provides the B-billet allocation plan to the TFPM manager. This plan directs B-billets to be attributed directly to AMOSs and grades or apportioned to AMOSs and grades by the model. Attributing B-billets to AMOSs generally increases the requirement for Marines in those AMOSs and grades.

The EPS planners primarily use the bottom line of the Target Force by AMOS and grade as output of the model. The First Term Planner uses the output to determine first term requirements by AMOS. The planner then develops a program plan for the MCRC and a classification plan for MMEA to categorize incoming recruits into AMOSs.

The Career Force Planner uses the output to develop the First Term Alignment Plan (FTAP). This FTAP is a determination of the numbers of allowable first term Marines that can reenlist into the career force. A comparison between the target force requirement and the reenlistment eligible population is used to determine the Selective Reenlistment Bonus (SRB) allocations across the MOSs. The FTAP and the SRB are developed using CNA models.

The Promotion Planner uses the TFPM output by AMOS to determine how many Marines by grade are needed in each AMOS. Promotion allocations are determined by comparing the current population and expected losses against the target force requirement. Promotion numbers and cutting scores are developed using SAS programs. The End-Strength Planner uses the bottom line of the TFPM output, without regard to MOS, to phase promotions across the fiscal year to ensure that we do not promote the right number of Marines to remain as close to the budgetary constraints as possible.

MMEA uses output from the TFPM in several ways. The classification plan is sent to MMEA as guidance for distributing new recruits into MOSs. The

FTAP provides guidance to MMEA in the reenlistment of first term Marines into the career force and the SRB associated with that reenlistment is dependent upon the size of the current population in relation to the target force population. Finally, MMEA uses the output of TFPM in making actual assignments to B-billets.

The program plan is sent to MCRC as guidance for recruiting. MCRC is required to fill program requirements to ensure that a large enough population exists to execute the classification plan. The Training and Education Division at MCCDC uses the calculations done in EPS for training to plan for and buy school seats to support both the classification plan and the lateral moves due to the FTAP.

MMPR conducts promotion boards for SNCOs and executes promotions for NCOs. These promotions are based on the plans developed in EPS and the cutting scores that EPS provides.

The ability of the EPS to evaluate the TFPM output is somewhat limited. They can determine if the model has attributed B-billets according to the B-billet plan, but the evaluation is more to detect errors than to actually evaluate performance. Their evaluation is limited to comparisons of the current to the last TFPM output to compare differences. EPS does not feel that they should have to evaluate the output of the TFPM. While they would certainly watch for blatant errors, they feel they should receive a finished product.

EPS would like the TFPM output to include structure numbers and the ASR. They would also like the T2P2 to be broken out individually. Finally, EPS does not receive an exception report identifying differences in the previous TFPM output. This was part of the previous COMPARE portion of the model.

APPENDIX I. MODEL QUESTIONS FOR THE CONTRACTOR AND MODEL MANAGER

A. MODEL DEVELOPER

1. Who developed the model?
2. Who commissioned development of the model? What were the qualifications of the developer?
3. What was the cost (approximately) of model development (hours and/or dollars)?

B. MODEL USER AND USE

1. Who is/are the model user/users? What level of knowledge or skill should the user have?
2. Where is the model used? When? How frequently?
3. How is the model integrated into the user's operation?
4. Is the model used in policy formulation? Policy evaluation? Which policies? The model is used primarily in policy implementation.
5. Has the user modified the model in any way? If so, how and why? Is that information being given to the model developer?
6. What are the benefits of using the model?
7. How often is each embedded system parameter or user-defined parameter re-estimated, if ever?
8. How flexible or adaptable is the model to changes in policies or environment? How easily can model modifications be made?

C. MODEL STRUCTURE

1. What is the purpose of the model?
2. Data Structures

- a. What input data is needed by the model? The input to the model is the Authorized Strength Report (ASR), the Individuals File, and the Model Dictionary.
 - b. What system values are embedded in the model?
 - c. Where is the data stored and how is it input to the model?
 - d. How accurate and reliable is the data?
3. What hardware and software are required to run the model?
4. What quantitative techniques are used in the model?
5. Output
 - a. What output data is produced?
 - b. What form is the output data in?
 - c. How is the data provided to the user?
 - d. Can the user control the output format? Can custom reports be created?

D. INDICATORS OF MODEL PERFORMANCE

1. What are the assumptions of the model? Implicit and explicit?
2. How realistic are the assumptions in terms of external conditions? Peacetime vs conflict? Downsizing vs growth?
3. How quickly can the model be run?
4. What improvements are needed? How will those improvements be incorporated in the model?

E. MODEL VALIDATION

1. What validation has been done on the model and its solution procedures?

F. MODEL DOCUMENTATION

1. What written documentation is readily available for the model user?
For model development and modification?
2. What on-line justification is available?
3. How good is the documentation? Is it easy to use? Self-explanatory?

G. MODEL QUESTIONS FOR PRIMARY USERS

1. What input/output does the section contribute/receive with the TFPM?
2. For what purposes do they use the output?
3. What is the impact of that input/output on other sections at HQMC?
4. What sections receive your output?
5. How do they receive the output? Are there any models involved?
6. What is the measure of effectiveness that you're receiving good data from the TFPM and that you're passing on good data?
7. What problems do you have with the output you receive?
8. What recommendation would you make to improve the model/output?

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